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BRIEFER ARTICLES

IMBEDDING AND WARMING STAND

(WITH TWO FIGURES)

The warming and imbedding stands for paraffin work used in laboratories are unsatisfactory. Commonly a plate of copper or other metal supported on legs is employed, and by some the apparatus devised by Dr. FERGUSON is used. The apparatus here described was devised five years ago, and it is at the suggestion of various botanists that this description is published. The apparatus is a modification of a familiar temperature stage for microscopes.

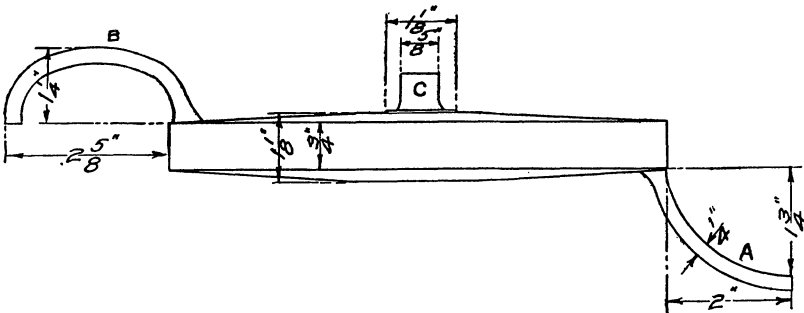


FIG. 1.—Side view of apparatus: *A*, water intake; *B*, water outlet; *C*, opening for thermometer.

The imbedding or warming stages commonly employed are unsatisfactory for the following reasons: (1) temperature cannot be controlled; (2) the imbedding trays cannot be removed quickly for cooling for fear of disturbing the orientation of the imbedded materials (and rapid cooling is essential for best results). The apparatus here described does not possess these objectionable features and permits of rapid work.

The apparatus consists of a copper box constructed on the principle of a water jacket of a condenser. The dimensions of the one employed here are length 20 cm., width 14 cm., and depth 2.8 cm. The box is provided with an inlet for water on the bottom (figs. 1 and 2, *A*), and an outlet for water on the upper side (figs. 1 and 2, *B*). There is also provided on the upper side an opening into which is fitted a stopper with a

thermometer (figs. 1 and 2, C). The box is provided with a specially constructed stand, though if desired this may be replaced by a simple tripod stand. Greater stability is secured, however, by having a stand made especially for the copper box.

In constructing the water box it is desirable to have the top of the box made of slightly heavier sheet copper than the bottom, 14 oz. copper for the bottom and 16 oz. copper for the top being satisfactory. By observing this precaution, all bulging due to water expansion or water pressure will manifest itself on the lower side, and a plane surface is maintained on the upper side, which of course is essential for good imbedding.

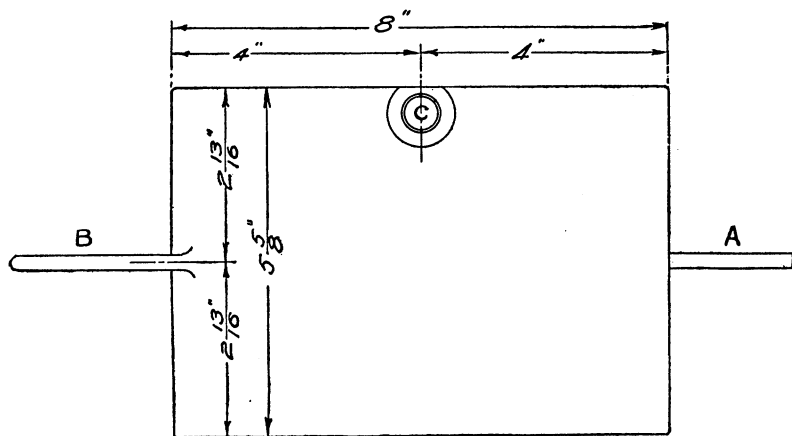


FIG. 2.—Top view of apparatus

In using the apparatus the box is first filled with water and the water supply then shut off. The box is heated by a Bunsen flame, and when the desired temperature is attained, as indicated by the thermometer, the flame may be removed. A constant temperature may also be maintained by continuous heating and then regulating the flow of water; this latter being the better method.

After the material has been oriented, it is rapidly cooled by replacing the warm water with a stream of cold water. If paper trays have been used for imbedding, they may be sufficiently cooled for removal and immersion in water in 30 seconds. For bringing the stand to the proper temperature the same time is required. The top of the box should of course be kept free of paraffin.—L. KNUDSON, *Cornell University, Ithaca, New York*.